We claim:

1. A process for determining an objective measurement of audio quality, comprising the steps of:

(i) processing a reference audio signal and a target audio signal according to a peripheral ear model to provide a reference basilar sensation signal and a target basilar sensation signal, respectively;

(ii) comparing the reference basilar sensation signal and the target basilar sensation signal to provide a basilar degradation signal;

(iii) processing the basilar degradation signal according to a cognitive model to determine at least one cognitive model component; and

(iv) calculating an objective perceptual quality rating from the at least one cognitive model component.

2. A process according to claim 1, wherein the at least one cognitive model component is selected from average distortion level, maximum distortion level, average reference level, reference level at maximum distortion, coefficient of variation of distortion, and correlation between reference and distortion patterns.

3. A process according to claim 1, further including steps of:

(a) calculating a harmonic structure in an error spectrum obtained through a comparison of the reference and target audio signals; and

(b) processing the basilar degradation signal and the harmonic structure according to the cognitive model.

4. A process according to claim 1, wherein step (ii) includes using one of a level-dependent and a frequency dependent spreading function having a recursive filter.

5. A process according to claim 1, wherein step (ii) includes using a recursive filter implementation of a spreading function.

6. A process according to claim 1, wherein step (iv) includes weighting separately for adjacent frequency ranges.

7. A process according to claim 1, further including a step of determining effects of at least one of perceptual inertia, perceptual asymmetry and adaptive threshold.

8. A process according to claim 1, further including a step of adjusting the basilar degradation signal in accordance with a variance of auditory filter envelope modulation rates of the reference audio signal.

9. A system for determining an objective audio quality measurement of a target audio signal, comprising:

a peripheral ear processor for processing a reference audio signal and a target audio signal to provide a reference basilar sensation signal and a target basilar sensation signal, respectively;

a comparator for comparing the reference basilar sensation signal and the target basilar sensation signal to determine a basilar degradation signal; and

a cognitive processor for processing the basilar degradation signal to determine at least one cognitive model component for providing an objective perceptual quality rating.

10. A system according to claim 9, wherein the at least one cognitive model component is selected from an average distortion level, maximum distortion level, average reference level, reference level at maximum distortion, coefficient of variation of distortion, and correlation between reference and distortion patterns.

11. A system according to claim 9, wherein the peripheral ear processor further provides a harmonic structure from an error spectrum obtained through a comparison of the reference and target audio signals.

12. A system according to claim 9, wherein the cognitive processor includes a multi-layer neural

network.

13. A system according to claim 9, wherein the cognitive processor includes pre-processing means for determining effects of at least one of perceptual inertia, perceptual asymmetry and adaptive threshold.

14. A system according to claim 9, wherein the peripheral ear processor includes a recursive filter.

15. A system according to claim 9, wherein the cognitive processor includes weighting means for adjacent frequency ranges.

16. A system according to claim 9, wherein the cognitive processor includes adjustment means for adjusting the basilar degradation signal according to a variance of auditory filter envelope modulation rates of the reference audio signal.